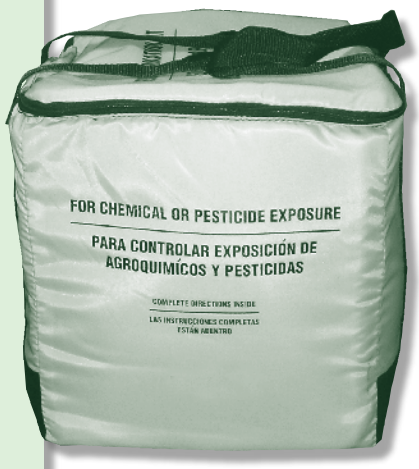
CHAPTER 9

EMERGENCY OR INCIDENT RESPONSE

LEARNING OBJECTIVES

After studying this chapter, you should:

- Know how to implement emergency response procedures as necessary and to execute an emergency response plan (e.g., contact agencies, administer first aid, clean up spills).
- Know how to identify how unintended pesticide releases (e.g., spills, fires) can have harmful effects on humans and the environment.
- Understand how to use emergency response equipment properly.
- Understand how to plan and implement cleanup activities or procedures to mitigate environmental impact.
- Know how to dispose of contaminated materials from a spill according to regulations.
- Know how to identify components of emergency response equipment (e.g., spill cleanup kit, first-aid kit, personal protective equipment).
- Know how to restrict access to authorized personnel only.



Although accidents and emergencies involving pesticides are rare; unfortunately, they do occur. Many pesticide accidents can be traced to applicator carelessness or misuse. Pesticide accidents or fires can result in water, soil, and air contamination; damage plants, injure livestock, wildlife, or pets; and endanger the health of the applicator and other people. In addition, personal financial losses can occur from cleanup costs, liability claims, and fines and penalties.

Manufacturers, transporters, dealers, and users of pesticides must treat all pesticide leaks, spills, and fires as emergencies and be prepared to respond to these emergencies promptly and correctly. Do all that you can to prevent accidents, but be prepared in case an emergency should arise.

EMERGENCY RESPONSE PLANNING

A carefully thought-out emergency response or contingency plan is one of the most important tools you can have to prevent an emergency situation from becoming a catastrophic event. An emergency response plan

can help protect the health and welfare of employees and the community, minimize environmental damage, and potentially reduce liability in the event of an accident. The importance of planning for emergencies cannot be overemphasized. Undertake this planning with painstaking attention.

Do you know what to do in a pesticide emergency?

An emergency may take the form of a severe weather event such as a tornado or flood or, more likely, an accident or fire. Serious public health and environmental consequences can occur when a tank truck overturns or a hose ruptures, spilling pesticides. An explosion and subsequent fire in a pesticide storage facility could result in serious injuries and environmental contamination, requiring the evacuation of persons downwind from the site of the fire. How you respond to a pesticide emergency may determine whether the incident becomes nothing more than a minor mishap or results in a major chemical release.

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Be prepared for emergency situations.

Consider the following guidelines when developing an emergency response plan:

- Designate an emergency coordinator. This person must have the knowledge and authority to direct and manage employee responses to a pesticide emergency, and to coordinate the efforts of local emergency response agencies such as fire, police, and paramedics.
- Maintain a list of emergency response agencies. Include names and telephone numbers of all response agencies you may have to call to assist in an emergency. Organize the list in the order to be called.

Emergency Response Agency Contacts

- Persons/agencies required to be notified by local, state, and federal requirements.
- Local emergency planning committees.
- Police and fire units.
- Paramedics and area hospitals.
- Appropriate chemical manufacturers and dealers.
- Containment and hazardous waste cleanup contractors.
- Your attorney, to protect your rights and the rights of others.

- Include an outline with your calling list of the information to be passed along during an emergency notification call; include the following:
  - Name and callback number of the person reporting the incident.
  - Precise location of the incident.
  - General description of what has occurred.
  - The exact name, quantity, and classification of each chemical involved.
  - The extent of any injuries.
  - Potential danger to the environment and persons living in the area.
- Prepare a map of your facility to include with your emergency response plan. Show a layout of all chemical storage buildings and bulk storage tanks; access roads; main shutoffs for electricity, water, and gas; perimeter fencing that could hinder access to the pesticide storage facility; the location of fire alarms, firefighting equipment, and protective clothing; and

drainage easements on the site. Provide emergency response agencies an updated copy of this map whenever changes are made at the facility (Figure 9.1).

- Provide your emergency response agencies with an area map that shows your facility in relation to the surrounding area. Fire, police, and paramedics cannot waste time trying to determine where your facility is located.

  - Equipment that can be used for diking, trenching, pumping, and vacuuming.
  - Containment and cleanup materials such as absorbent materials and neutralizing agents.
  - Location and inventory of fire extinguishers and protective equipment.
  - Any specialized equipment such as self-contained breathing apparatus.

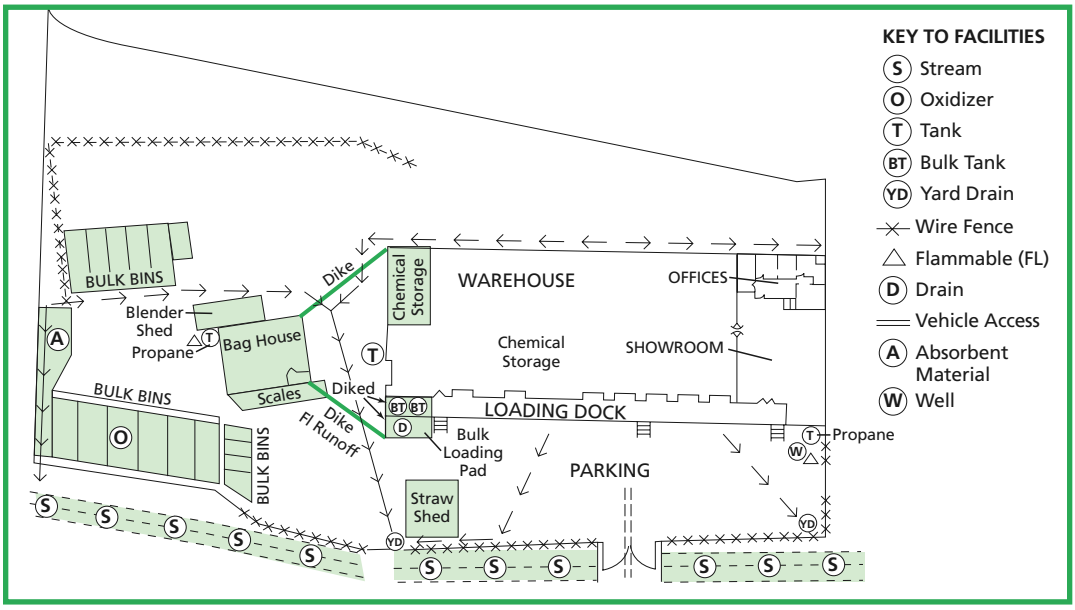


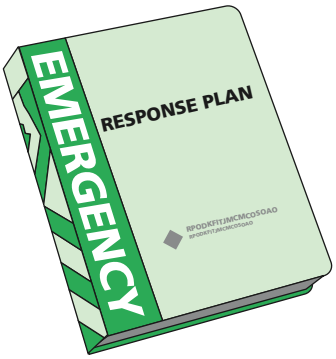
Figure 9.1
Include a facility map as part of the emergency response plan.

- Keep a product inventory of the types and quantities of chemicals stored at your facility. Let your emergency response plan reflect peak season storage. The primary information in the product inventory includes the product names, container volumes, and locations of containers in the storage facility. Also, keep copies of pesticide labels, MSDS, and a description of protective equipment that may be required for the chemicals in storage. Keep a set of these documents at a separate site away from the storage area.
- Keep an inventory of emergency equipment and supplies you have available on site, including:

Do you know where your emergency equipment is?

Maintain an updated list of suppliers who can provide additional equipment and materials that may be needed in the event of an emergency.

The backbone of any emergency response plan is an outline of the exact sequence of actions to take in a crisis. Determine which situations you can handle on your own and which require outside help. Plan step-by-step procedures to respond to various emergencies, such as fires, spills, ammonia leaks, and transport accidents. Determine who is responsible for each specific task in the event of an



Develop a written emergency response plan.

emergency. Specify in writing every activity from sounding the alarm to directing the response agencies. Once internal emergency procedures have been established, be sure to share this information with local response agencies. Always keep a current plan on file with local response authorities.

Emergency response or contingency planning is the key to protecting every facility and the surrounding community from a potentially catastrophic situation.

FIRES

Pesticide products vary significantly in their flammability and storage hazard. Those requiring extra precautions usually include the label statement "Do not use or store near heat or open flame." Pesticides containing oils or petroleum solvents are the ones most likely to have these warnings, although certain dry formulations also present fire and explosion hazards.

A number of potential problems may be associated with pesticide fires:

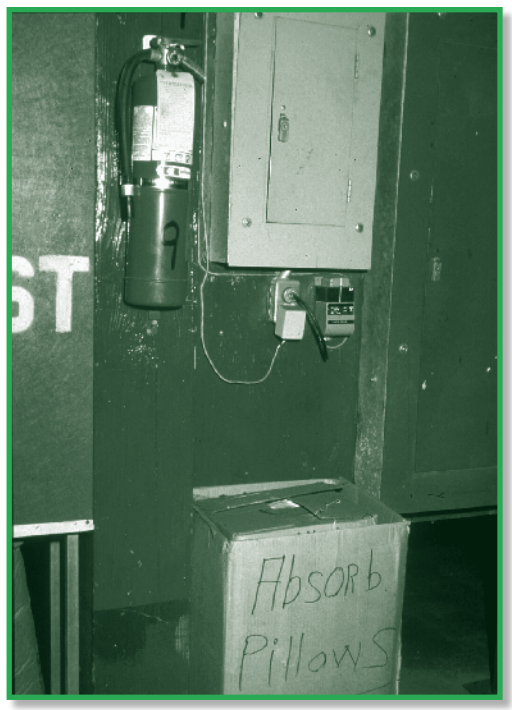
- The pesticides may be highly flammable or explosive.
- The pesticides may give off highly toxic vapors or smoke that may harm firefighters, nearby residents, animals, or plants.
- Pesticide residues may be present in the debris and soil following a fire at a pesticide storage facility.
- Runoff from the fire site may contain highly toxic chemicals.

Precautions to Reduce Fire Hazards

- Locate the storage facility as far as possible from places where people and animals live.
- Keep the storage facility locked at all times.
- Post signs that indicate pesticides are stored in the facility.
- Store combustible pesticides away from steam lines and other heating systems.
- Do not store glass or pressurized containers in sunlight where they can concentrate heat and possibly explode or ignite.
- Install fire detection systems in large storage areas.
- Keep foam-type fire extinguishers approved for chemical fires in all storage areas.

Paul Love, Michigan State University

Install fire detection systems such as this sprinkler system with a sensor.



Paul Love, Michigan State University

Have a fire extinguisher approved for chemical fires readily available.

Edward Crow, Maryland Department of Agriculture

Post signs that indicate pesticides are stored in the facility.

- Notify the local fire company of the location and contents of the storage facility.
- Develop an emergency plan and train all workers in its execution.
- Keep a written inventory of the pesticides held in storage and file the list away from the storage facility.

Prompt and responsible action is essential in the event of a chemical fire. Emergency or contingency planning is the cornerstone of a responsible action plan. Coordinate all details on responding to a fire with local emergency response officials and review at least annually. Take the following actions in the event of a chemical fire:

- Evacuate the premises.
- Notify the fire department and inform the firefighters of the nature of the pesticides involved.
- Provide emergency response personnel with MSDS, which include technical and emergency information.
- Keep people away. Establish a security perimeter to discourage onlookers.
- If significant smoke is generated, evacuate all people and animals in the vicinity, especially those downwind.
- Contain small fires with fog, foam, or dry powder. If only water is available, use it as a fine spray or fog. Use only as much water as absolutely necessary. Do not use water jets because they can break bags and glass containers. Water used to fight pesticide fires may spread the contamination to the surrounding area.
- Check that water and spilled chemicals are being contained.
- For larger fires, consider withdrawing and allowing the fire to burn out. This option is preferred over using water to fight the fire, which can lead to widespread environmental contamination. If runoff water cannot be avoided, build dikes to contain the contaminated water.
- Clean and dispose of equipment and all clothing. All personnel involved should shower after fighting the fire.

After the fire, do not attempt cleanup and salvage operations until the area has cooled, and then, under expert supervision only.

J. Ples Spradley, University of Arkansas

A National Fire Protection Association (NFPA) warning on a storage box for fumigants. The strikeover on the letter W in the white diamond alerts firefighters not to use water to put out a fire.

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Emergency responders conducting a mock emergency drill at a facility.

Pat Hipkins, Virginia Tech Pesticide Programs

Cleanup and salvage operations after a fire must be done under expert supervision after everything has cooled.

PESTICIDE SPILLS

A spill is any accidental release of a pesticide. The spill may be a minor one involving only a few leaking containers, or it may be a major accident in which a piece of equipment malfunctions and releases its contents, or a tank truck or rail car overturns and spills its cargo. All users of pesticides must be thoroughly familiar with the laws and guidelines governing chemical spills. The inability to respond properly to such an emergency, no matter how minor the problem, could seriously endanger public health and environmental quality.

The suggested guidelines in the event of a chemical spill are known as the three Cs: **CONTROL** the spill, **CONTAIN** it, and **CLEAN** it up.

Tom Bowman, Virginia Tech Pesticide Programs

Clean up all spills immediately.

The Three Cs

Control
Contain
Clean up the Spill

Control the Spill

Take immediate steps to control the release of the products being spilled. If a sprayer has tipped over, if a pesticide is leaking from a damaged tank truck, or if a container on a storage shelf is leaking, do whatever you can to stop the leak or spill at once. For instance, smaller containers can be put into larger containers to prevent further release of the chemical. For larger leaks, try to plug the leak, if possible. Outside assistance often is required to control large leaks.

Never expose yourself unnecessarily to leaking chemicals—always wear protective equipment when attempting to control a leak. Never charge in blindly if someone is injured; first, make sure you are properly protected.

A cellular phone must be standard equipment on every vehicle transporting pesticides. Alert the state and local police if the spill occurs on a public highway. Contact the appropriate state regulatory agency (or agencies) if the chemical is a pesticide. In certain cases, it may be necessary to alert the fire department, public health officials, and/or the nearest hospital emergency room. Be sure to have the product label and MSDS available for emergency responders.

Adapted from OSU *Applying Pesticides Correctly*

Wear appropriate PPE when cleaning up a spill.

If the spill is large or dangerous, have someone get help. Do not leave the site unattended. Operators need radio or telephone communication available in the vehicle in case they need to call for assistance. The first contact you make in case of a spill is to your county emergency management office, which can help coordinate the emergency response. In addition, CHEMTREC provides access to emergency response information and technical assistance from chemical industry experts. CHEMTREC's emergency phone number is 1-800-424-9300. ***This number is for emergency assistance only.***

A very important number is the emergency telephone number found on many product labels and on transportation or shipping papers. The lines are answered 24 hours per day by people who are prepared to handle pesticide emergencies involving the company's products.

For emergency response information call:

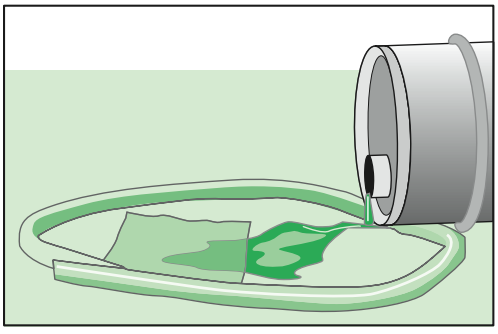
CHEMTREC
1-800-424-9300

Rope off the contaminated area; keep people at least 30 feet away from the spill. Avoid contact with any drift or fumes that may be released. Do not use road flares if you suspect the leaking material is flammable. At times it may be necessary to evacuate people downwind from the spill.

Contain the Spill or Leak

At the same time the leak is being controlled, contain the spilled material in as small an area as possible. Do everything possible to keep it from spreading or getting worse. In some situations, you may need to use a shovel or power equipment to construct a dike or dam. The important thing to remember is ***do not let the spilled material get into any body of water,*** including storm sewers or drains.

If the chemical does contaminate a stream, pond, or any other waterway, immediately contact the state agency responsible for streams and fisheries and the agency for pesticide regulation. Also notify the local emergency planning coordinator if the pesticide spilled is listed as an extremely hazardous substance and exceeds the reportable quantity (RQ) (see SARA Title III, Appendix D). Do not delay in notifying authorities because they must alert downstream users as soon as possible to prevent accidental poisoning of livestock and to avoid contamination of irrigated crops and soil.



Take action to prevent spills from spreading. In this case, an absorbent spill tube is used to contain the spill.

You can further contain liquid spills can be further contained by spreading absorbent materials such as fine sand, vermiculite, clay, or pet litter over the entire spill. Avoid using sawdust or sweeping compounds if the pesticide is a strong **oxidizer** (see label or MSDS) because such a combination presents a possible fire hazard. In addition, nonspecific absorbent materials packed in pillows, tubes, or pads can be placed directly on the spill or used to dike around the spill area. Waste disposal is then simplified because the contaminated pillows, tubes, or pads can be placed into heavy-duty disposal bags without dust or spillage. Keep adding absorbent material to the contaminated area until all the liquid is soaked up.

National Fire Protection Association

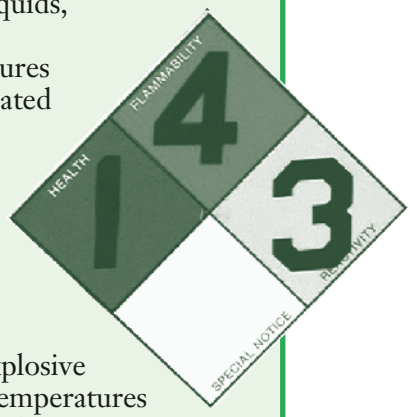
A hazardous rating system used to assist emergency response personnel is the NFPA Hazard Identification System. This system uses a diamond-shaped warning symbol. The top, left and right boxes refer to flammability, health, and instability hazards, respectively, and each contains a number from 0 to 4. The bottom box is used for special hazards; the most common of these is a warning against the use of water. See the diagram below.

Health Hazard - Blue Section

4 Severe hazard
3 Serious hazard
2 Moderate hazard
1 Slight hazard
0 Minimal hazard

Flammability Hazard - Red Section

4 Flammable gases, volatile liquids, pyrophoric materials
3 Ignites at ambient temperatures
2 Ignites when moderately heated
1 Must be preheated to burn
0 Will not burn



Special Hazard - White Section

OX Oxidizer
~~W~~ Avoid use of water

Instability - Red Section

4 Capable of detonation or explosive decomposition at ambient temperatures
3 Capable of detonation or explosive decomposition with strong initiating source
2 Violent chemical change possible at elevated temperature and pressure
1 Normally stable, but becomes unstable if heated
0 Normally stable

Adapted from OSU *Applying Pesticides Correctly*

Use an absorbent material to help clean up a spill.

In the case of dust, wettable powder, or granular spills, you can reduce spreading by lightly misting the material with water or covering the spill using some type of plastic cover. Discard the cover after use. Disposal of all hazardous wastes must be done in strict accordance with state and federal laws (see RCRA, Appendix D).

Clean Up the Spill

Once the spill has been contained, sweep it up and place it in a steel or fiber drum lined with a heavy-duty plastic bag. It may then be necessary to decontaminate or neutralize the area. Use ordinary household bleach in water (approximately 30 percent bleach), hydrated lime, or a commercial decontamination preparation to help neutralize the spill area. Remember to wear protective equipment. ***Do not use bleach and lime together.*** Work this cleaning material into the spill area using a coarse broom. Then add fresh absorbent material to soak up the now contaminated cleaning solution. Sweep up this material and place it in a plastic bag or drum for disposal. It will be necessary to repeat this procedure several times to ensure that the area has been thoroughly decontaminated.

The only effective way to decontaminate soil saturated with a pesticide is to remove the top 2 to 3 inches of soil. This contaminated soil is now considered hazardous waste and must be disposed of according to state guidelines. Once the contamination has been removed, cover the area with at least 2 inches of lime, and finally, cover the lime with fresh topsoil. Soils contaminated as the result of application errors or minor spills can sometimes be cleaned up by applying activated charcoal to the contaminated surface immediately after the spill or misapplication. The charcoal may adsorb or tie up enough chemical to avoid significant plant injury and long-term contamination. However, application of activated charcoal to areas where large spills have occurred does little to reduce soil contamination and subsequent plant damage.

Clean any vehicles and equipment that were contaminated either as a result of the original accident or during the cleanup and disposal procedures. Before you begin, be sure you are properly clothed and protected to avoid contact with the chemical. Use ordinary household bleach in water (approximately 30 percent bleach) or an alkaline detergent (dishwashing soap) solution to clean your equipment. ***Do not mix bleach and alkaline detergent together.*** Equipment such as brooms, leather shoes, and cloth hats cannot be effectively decontaminated and must be discarded. Also, do not save disposable garments and gloves or badly contaminated clothing. As soon as you are

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Keep emergency supplies and a shovel on hand.

finished with the spill and equipment cleanup, wash yourself thoroughly with soap and water. Wash any part of your skin that might have been exposed, and always wash your face, neck, hands, and forearms.

For legal protection, it is advisable to keep records of your activities and conversations with regulatory authorities, emergency response personnel, and the general public when dealing with a pesticide spill. Photographs help document any damage as well as the cleanup process.

Prevent Spills

A key to preventing pesticide spills is to maintain all vehicles and application equipment properly. Leaks and drips from cracks or loose fittings in equipment are indications of potential trouble. An understanding of how spray equipment works, especially a pumping system, is often essential to controlling the flow of a product and minimizing equipment damage. Safe driving and other good operating habits further reduce the likelihood of a spill.

Keep a spill cleanup kit readily available whenever you handle pesticides or their containers. Also maintain a spill kit at the business location where pesticides are mixed, loaded, and stored, and on each vehicle that transports pesticides. If a spill occurs, you will not have the time or the opportunity to find all of the items.

Include the following in a kit:

- Telephone numbers for emergency assistance.
- Sturdy gloves, footwear, and apron chemically resistant to most pesticides.
- Protective eyewear.
- An appropriate respirator, if any of the pesticides require the use of one.
- Containment tubes or pads to confine the leak or spill.
- Absorbent materials, such as spill pillows, absorbent clay, sawdust, pet litter, activated charcoal, vermiculite, or paper for liquid spills.
- Sweeping compound for dry spills.
- A shovel, broom, and dustpan.
- Heavy-duty detergent.
- A fire extinguisher rated for all types of fires.
- Any other spill cleanup items specified on the labeling of any products you use regularly.
- A sturdy plastic container that holds the quantity of pesticide from the largest pesticide container being handled and that can be tightly closed.

Store spill kit items in a plastic container and keep them clean and in working order until needed.

The faster you can contain, absorb, and dispose of a spilled or leaking chemical, the less chance that it will cause harm.

Do not leave the spill site until someone relieves you. Have someone present at the spill site continuously until the chemical is cleaned up and the danger removed. If the spill is indoors, get out of the building. Open doors and windows and set up a portable fan.

SUMMARY

To prepare for a pesticide emergency or incident, have a well-thought-out emergency response plan. Make sure the plan includes designating an emergency response coordinator, maintaining a list of emergency response agencies, preparing a map of the facility, keeping a product inventory of the types and quantities of stored chemicals, and knowing what emergency equipment and supplies are available. Be sure all employees at the facility are familiar with the emergency response plan and know the sequence of actions to take in a crisis.

Pesticide fires are of particular

concern because of the variable nature of pesticide products in a storage facility. Some products are more flammable than others and may even be explosive. The pesticides may give off vapors or smoke highly toxic to people, animals, and the surrounding environment. Actions to take in the event of a pesticide fire are a key component of any emergency response plan. It is important to know what products are stored and where. Emergency response personnel must be notified of the kind of pesticides involved so they can take appropriate action to protect themselves and the surrounding environment. In some cases it may be better to let a pesticide fire burn out rather than spreading the contamination by spraying the fire with water. Smaller pesticide fires can often be dealt with by using fog, foam, or dry powder.

When dealing with pesticide spills, it is important to remember **the three Cs—control, contain,** and **clean up** the spill. Immediate steps must be taken to control the release of products being spilled. Have emergency telephone numbers readily available in the case of a large or dangerous spill. It is important to try to contain the spilled material in as small an area as possible. This may involve constructing a dike or a dam around the spill area. It is critical to prevent the spill from entering any water source. Use absorbent materials such as fine sand, vermiculite, clay, pet litter, or absorbent materials packed in pillows, tubes, or pads to clean up liquid spills. Once the spill is absorbed, it can be swept up and placed in a steel or fiber drum lined with a heavy-duty plastic bag. Dry pesticide spills can be contained initially by lightly misting the pesticide with water and covering it with a plastic cover. The dry spill then can be swept up and discarded in the same manner as a liquid spill.

The best way to manage pesticide spills is to prevent them from happening in the first place. Always keep a spill cleanup kit available wherever pesticides are handled. All persons using or transporting pesticides and other hazardous chemicals have a responsibility to protect the public and the environment. Doing everything possible to avoid spills and adhering to a few basic guidelines when handling spills and leaks can go a long way toward fulfilling that responsibility.